

REMARKS

Claims 27 to 30 are pending and have been examined. Claims 14 to 26 and 31 to 34 have been withdrawn from consideration. The summary sheet of the last Office Action indicated that claims 27-29 are pending, but omitted claim 30 from the list. This appears to be an error since claim 30 was never cancelled or withdrawn from consideration. Reconsideration of pending claims 27 to 30 is requested in view of the following remarks.

§ 102 Rejections

Claim 29 stands rejected under 35 USC § 102(b) as being anticipated by Garcia et al. (U.S. 6,454,765). Applicants respectfully traverse this rejection.

A prior art reference anticipates a patent claim under 35 USC § 102 only if the reference discloses each and every limitation of the claim. *Rowe v. Dror*, 112 F. 3d 473 (Fed. Cir. 1997). Claim 29 of the present application is directed to a ceramic framework that has been treated with a coloring composition containing a solvent, a metal salt or metal complex in an amount of 0.01 to 7.0 wt.-%, and a specified amount of 10,000-50,000 Mn polyethylene glycol. The Examiner acknowledges that “Garcia et al. does not teach the use of 10,000-50,000 Mn polyethylene glycol” and also “does not teach the precise percent of metal in the solution” (Office Action, p. 2-3). However, the Examiner asserts that these components “will be driven off during the firing process” and thus “the resultant product will be expected to be similar [to the product claimed in 29] absent any evidence to the contrary.”

Asserting that a product described in the prior art is “similar” to the claimed product is not sufficient to establish anticipation under 35 USC § 102. Anticipation can be found only if a reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F. 2d 775 (Fed. Cir. 1985). The present application provides ample evidence demonstrating that use of polyethylene glycol (PEG) in the coloring solution results in a product that is different from the Garcia product. Specifically, in Table 1 the application shows:

a) a sample treated with coloring solution FS5, which did not contain PEG, had a distortion of 0.200 mm after firing;

b) a sample treated with coloring solution FS5*, which did contain PEG, had a distortion of 0.061 mm after firing; and

c) a sample fired directly without any coloring treatment had a distortion of 0.038 mm.

This data demonstrates that a ceramic specimen treated with a coloring solution containing PEG (as recited in the claims) and fired afterwards is different from a ceramic specimen treated with a coloring solution that does not contain PEG (as is the case with Garcia) and fired afterwards. Evidence of the difference is shown by the measured distortion value. It is, therefore, clear that the presence or absence of PEG in the coloring solution has a dramatic influence on the resulting ceramic specimen, even if, as the Examiner has asserted, the PEG itself is burned out during firing¹.

Furthermore, with respect to the metal content of the solution, Applicants noted that the metal component is generally expected to remain in the ceramic framework after firing. Since the metal content of the Slurry described in Garcia is substantially different from that recited in claim 29, there is no reason to assume these products would have the same metal content after firing.

Since Garcia fails to disclose at least two of the elements recited in claim 29, i.e. a 10,000-50,000 Mn PEG in the treatment composition and a metal salt soluble in solvent in a range of 0.01 to 7%, Garcia fails to anticipate this claim. Applicants respectfully submit that the rejection of claim 29 under 35 USC § 102(b) should be withdrawn.

§ 103 Rejections

Claims 27 and 30 stand rejected under 35 USC § 103(a) as being unpatentable over Garcia et al. (U.S. 6,464,765) in view of Williams et al. (U.S. 6,786,994). Claim 28 similarly stands rejected as being unpatentable over Garcia in view of Williams, further in view of Schrewellus (U.S. 3,027,331). Applicants respectfully traverse these rejections.

There is no suggestion or motivation in the prior art cited by the Examiner for a skilled person to combine Garcia with Williams since they involve differing subject matter seeking to address different problems. Garcia is directed to a saturated soluble salt slurry for coloring

¹ Contrary to the Examiner's assertion, applicants never acknowledged that the polyethylene glycol is completely driven off during the finishing process. Rather, Applicants just tried to point out that, whether or not there is any PEG remaining after firing, the presence of PEG in the coloring solution prior to firing resulted in a product that is different from the Garcia product.

ceramics while Williams deals with a heat-setting label sheet. Although Garcia discloses that the Slurry can comprise humectants, the claimed invention is not directed to a method of avoiding premature drying before firing (e.g. by adding PEG as an humectant), but rather seeks to provide a colored ceramic framework having less distortion after firing. There is no teaching or suggestion in any of the cited references that PEG might assist in reducing sintering deformation as demonstrated in the present application. This is an unexpected benefit not envisioned by the prior art.

The Examiner asserts that the evidence presented in the application concerning reduced sintering deformation is not persuasive because:

“1.) The sintering deformation is not a claimed limitation.

2.) It is not clear how this deformation gives superior results.

3.) One would expect more deformation in the composition with PEG as it is driven off during firing and one skilled in the art would expect it to shrink as it loses mass (common sense).

4.) If more deformation is unwanted then the untreated composition wins, if deformation is wanted then the solution without PEG, wins, either way these results add weight to examiners position on the rejection.” (Office Action p. 6)

In response to these four points, Applicants have the following comments:

1.) Although claim 29 does not recite any specific level of reduction in sintering deformation, the claim does require that the treating solution contain 1-8% by weight of PEG, which is the component that leads to the reduced deformation when present at this concentration.

2.) One skilled in the art would understand that a lower distortion value is beneficial because it results in a better fit of the ceramic framework in a patient's mouth.

3.) The experiments described in the application show that the deformation measured for the PEG-containing coloring solution (FS 5*) was less than the deformation measured for the PEG-free coloring solution (FS 5). These results are surprising because they are contrary to what the Examiner states would be the expected (common sense) outcome (i.e. it would be expected that the presence of PEG results in more deformation since it is burned off). These results

confirm the non-obviousness of the invention because the PEG is providing an unexpected benefit neither disclosed nor suggested in any of the references cited in the Office Action.

4.) The Examiner states that "if more deformation is unwanted then the untreated composition wins" however the untreated composition would not be tooth colored since treatment with the metal-containing solution is what gives the framework its color. By using the present invention, it is possible to achieve the benefit of low deformation while still providing the framework with a tooth color. Metal-containing coloring solutions without PEG are able to provide a tooth-like color but, as shown in Table 1 of the present specification, they exhibited greater deformation than those containing PEG (see Table 1).

In view of the above, Applicants respectfully submit that the rejections of claims 27, 28 and 30 under 35 USC § 103 (c) should be withdrawn.

CONCLUSION

It is submitted that the application is now in condition for allowance. Examination and reconsideration of the application is requested.

Respectfully submitted,

Oct. 28, 2008

Date

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